

**Gisma
University
of Applied
Sciences**

Gisma University of Applied Sciences
Department of Computer and Data Sciences

Assessment Brief

M608 Business Project in Computer Science

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Deployment link : <https://uae-realestate-dashboard-erwfczenfxxyqdjtbbsrs.streamlit.app/>

Github repository link: <https://github.com/Mo-hitDXB/UAE-RealEstate-Dashboard.git>

Project Overview

The UAE real estate market is one of the most dynamic and data heavy in the region. Thousands of transactions are done each year across multiple regions and properties, let alone the data provision for types of supply. However, without business intelligence and proper analytic tools, even basic transaction information at ground level is difficult to interpret. Therefore, the goal of the project is to create and implement an interactive Business Intelligence dashboard for real time access and improved historical transaction appreciation. Such a design will facilitate user understanding of property appreciation over time, year on year differences, regional expansion or contraction by degree and other factors that impact desirability, purpose and transactions at a per transaction level, all through a customizable visual presentation.

Business Problem and Motivation

Real estate investors, analysts and decision makers need up to date, organized data to assess market performance and investment potential. Yet, as it stands, there is not a universal analytical dashboard through which decision makers could easily apply their findings but rather, sit through a presentation of the findings or compile a dataset on their own. Thus, this only allows performance investigation but less comparative/exploratory investigation. Therefore, the business problem is a disjointed, yet, organized, non-interactive presentation of real estate information that could easily be synthesized into one cohesive avenue with filter options to assess trends to determine performance. By having a user filter a dashboard by year, state and property type, it's essentially an easier way to a more proactive decision-making process.

Dataset Description

The dataset used for this project is the Dubai Land Department's open data on real estate transactions. The real estate transactions by the Dubai Land Department are a historical dataset at the transaction level, including transaction date, transaction value (in AED), property type, and area name. This dataset is available in a very large, unrefined version, with various missing values that required preprocessing steps such as cleaning, date transformation, and subsequently transformed final features like year and month of transaction. Therefore, this final, transformed dataset is appropriate for trend analysis and visualization with reliable properties transformed to ensure consistency and reliability over time.

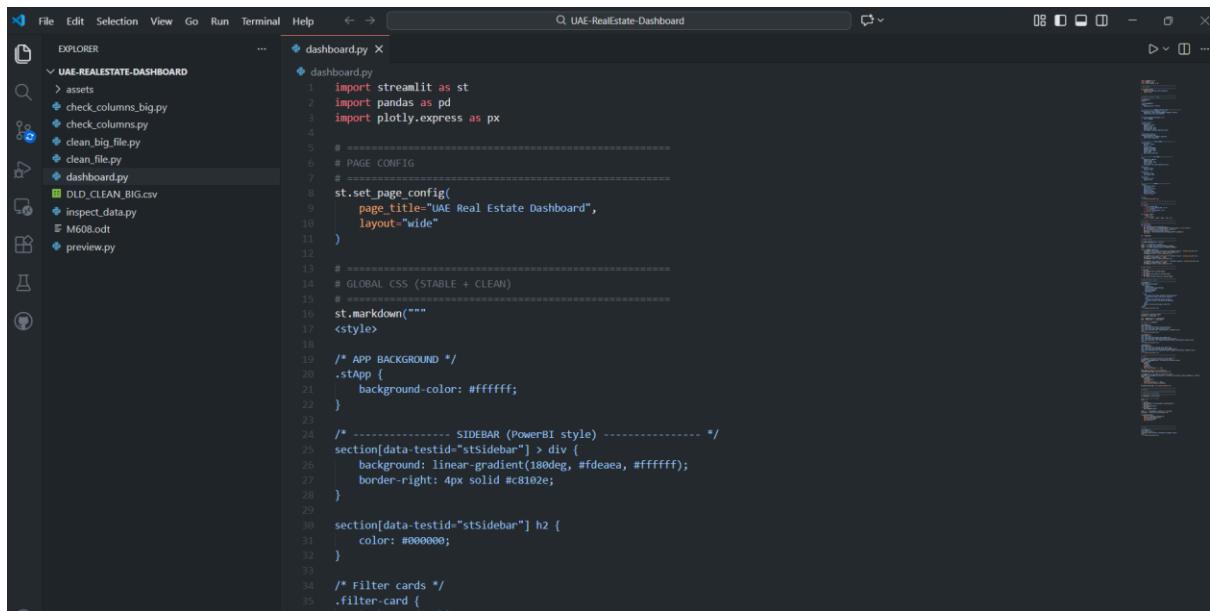
- Dataset_Columns_View.png

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	S	T	Y	X	AA	AB	AC	AD	AE	AF	AG	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU
1	1-11-202	11	1	Sales	Sell	4	Villa		Residential	1	Existing	317 Jumeirah Fort									Burj Khalifa Emirates Tower Dubai Mall																			
2	1-11-202	11	1	Sales	Sell	4	Villa		Residential	1	Existing	375 Jumeirah Fort									Burj Khalifa Business Bay N Dubai																			
3	1-11-202	11	1	Sales	Sell	3	Unit		Residential	1	Existing	375 Jumeirah Fort									Burj Khalifa Business Bay N Dubai																			
4	1-11-202	11	1	Sales	Sell	4	Villa		Residential	1	Existing	410 Palm Jumeirah TANZANITE									1040 TIARA RESIDENCE Palm Jumeirah Al Asqa Business Bay N Dubai																			
5	1-11-202	11	1	Sales	Sell	3	Unit		Residential	1	Existing	410 Palm Jumeirah KEMPINSKI RESIDENCES									1041 ZABEEL SARAY Palm Jumeirah Al Asqa Jumeirah Beach Marina I D020/01/0264 4 BR																			
6	1-11-202	11	1	Sales	Sell	3	Unit		Residential	1	Existing	410 Palm Jumeirah ROYAL AMWY RESIDENCES SOUTH									97 EMERALD PALACE Palm Jumeirah Al Asqa Al Sufouh																			
7	1-11-202	11	1	Sales	Sell	3	Unit		Residential	1	Existing	526 Business Bay LOFTS EAST									Open Bay Burj Khalifa Burj Khalifa Du Dubai M QPQJ028																			
8	1-11-202	11	1	Sales	Sell	3	Unit		Residential	1	Existing	526 Business Bay LOFTS EAST									144.46 36²⁶ 21141																			
9	1-11-202	11	1	Sales	Sell	3	Unit		Residential	1	Existing	526 Business Bay LOFTS EAST									144.46 36²⁶ 21141																			
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11	1-11-202	11	1	Sales	Sell	3	Unit		Residential	1	Existing	410 Palm Jumeirah									144.46 36²⁶ 21141																			
12	1-11-202	11	1	Sales	Sell	3	Unit		Residential	1	Existing	410 Palm Jumeirah AL HASBEE B7									144.46 36²⁶ 21141																			
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17	1-11-202	11	1	Sales	Sell	3	Unit		Residential	1	Existing	410 Palm Jumeirah AL HABIB									144.46 36²⁶ 21141																			
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24	2-13-202	13	2	Mongag	Mongag	3	Unit		Residential	1	Existing	410 Palm Jumeirah AL SHAHEE									144.46 36²⁶ 21141																			
25	2-13-202	13	2	Mongag	Mongag	3	Unit		Residential	1	Existing	410 Palm Jumeirah AL SHAHEE									144.46 36²⁶ 21141																			
26	2-13-202	13	2	Mongag	Mongag	3	Unit		Residential	1	Existing	410 Palm Jumeirah AL SHAHEE									144.46 36²⁶ 21141																			
27	1-11-202	11	1	Sales	Sell	3	Unit		Residential	1	Existing	410 Palm Jumeirah AL DEBAR									144.46 36²⁶ 21141																			
28	1-11-202	11	1	Sales	Sell	3	Unit		Residential	1	Existing	410 Palm Jumeirah AL DEBAR									144.46 36²⁶ 21141																			
29	1-11-202	11	1	Sales	Sell	3	Unit		Residential	1	Existing	410 Palm Jumeirah AL DEBAR									144.46 36²⁶ 21141																			
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31	1-11-202	11	1	Sales	Sell	3	Unit		Residential	1	Existing	410 Palm Jumeirah AL DEBAR									144.46 36²⁶ 21141																			
32	1-10-202	102	1	Sales	Sell	3	Unit		Residential	1	Existing	410 Palm Jumeirah BALOIS RESIDENCE 1									144.46 36²⁶ 21141																			
33	1-10-202	102	1	Sales	Sell	3	Unit		Residential	1	Existing	410 Palm Jumeirah BALOIS RESIDENCE 1									144.46 36²⁶ 21141																			
34	1-10-202	102	1	Sales	Sell	3	Unit		Residential	1	Existing	410 Palm Jumeirah BALOIS RESIDENCE 2									144.46 36²⁶ 21141																			
35	1-10-202	102	1	Sales	Sell	3	Unit		Residential	1	Existing	410 Palm Jumeirah BALOIS RESIDENCE 2									144.46 36²⁶ 21141																			
36	1-10-202	102	1	Sales	Sell	3	Unit		Residential	1	Existing	410 Palm Jumeirah BALOIS RESIDENCE 3									144.46 36²⁶ 21141																			
37	2-13-202	13	2	Mongag	Mongag	3	Unit		Residential	1	Existing	410 Palm Jumeirah PALM BEACH TOWERS-3									144.46 36²⁶ 21141																			
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39	1-10-202	102	1	Sales	Sell	3	Unit		Residential	1	Existing	410 Palm Jumeirah PALM BEACH TOWERS-3									144.46 36²⁶ 21141																			
40	1-10-202	102	1	Sales	Sell	3	Unit		Residential	1	Existing	410 Palm Jumeirah PALM BEACH TOWERS-3									144.46 36²⁶ 21141																			
41	1-11-202	11	1	Sales	Sell	3	Unit		Residential	1	Existing	410 Palm Jumeirah PALM BEACH TOWERS-3									144.46 36²⁶ 21141																			
42	1-11-202	11	1	Sales	Sell	3	Unit		Residential	1	Existing	410 Palm Jumeirah PALM BEACH TOWERS-3									144.46 36²⁶ 21141																			
43	1-11-202	11	1	Sales	Sell	3	Unit		Residential	1	Existing	410 Palm Jumeirah PALM BEACH TOWERS-3									144.46 36<sup>2																			

Methodology and Implementation

The creation of the dashboard is based on a typical data analytics process. For instance, the dataset was cleaned and formatted using Python and the Pandas library, where I removed bad records and filtered relevant features to apply. At this point, I grouped the dataset by monthly transaction values and area summaries. The dashboards were created using Streamlit, for web-based interactive applications, while the Plotly library was applied for interactive visualizations. Cached loaders were implemented for effective handling of large datasets.

Dashboard_Code_Structure.png



A screenshot of a code editor (VS Code) showing the file structure and content of a Streamlit dashboard project named "UAE-RealEstate-Dashboard". The Explorer sidebar shows files like assets, check_columns_BIG.py, clean_BIG_file.py, dashboard.py, DLD_CLEAN_BIG.csv, inspect_data.py, M608.odt, and preview.py. The main editor pane displays the content of dashboard.py:

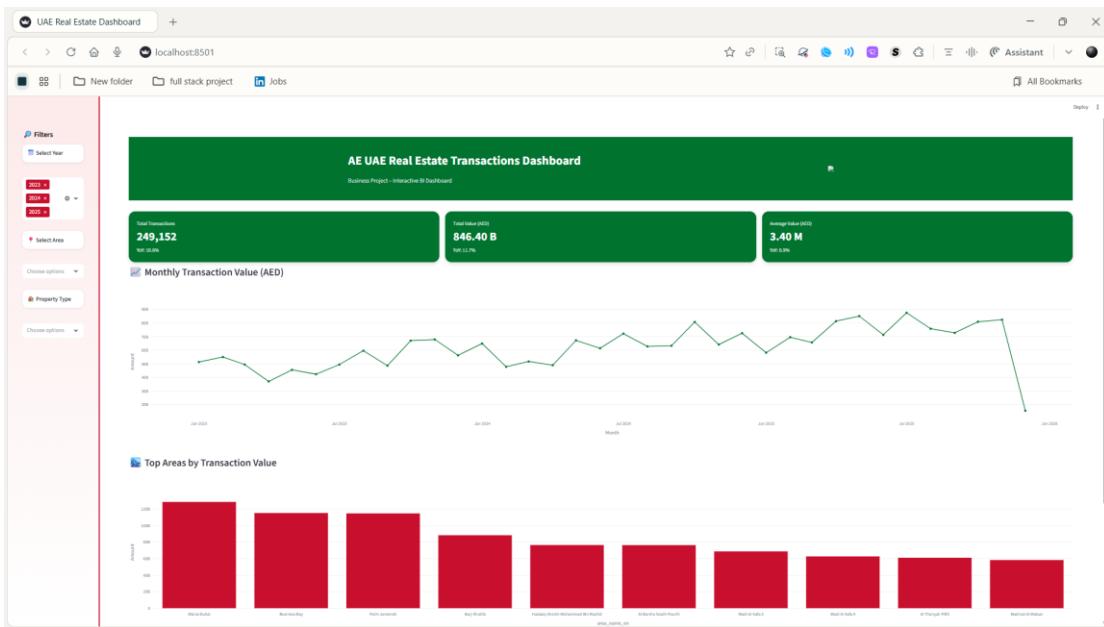
```
File Edit Selection View Go Run Terminal Help < > Q UAE-RealEstate-Dashboard dashboard.py X dashboard.py
1 import streamlit as st
2 import pandas as pd
3 import plotly.express as px
4
5 # =====
6 # PAGE CONFIG
7 # =====
8 st.set_page_config(
9     page_title="UAE Real Estate Dashboard",
10    layout="wide"
11 )
12
13 # =====
14 # GLOBAL CSS (STABLE + CLEAN)
15 # =====
16 st.markdown("""
17 <style>
18
19 /* APP BACKGROUND */
20 .stApp {
21     background-color: #ffffff;
22 }
23
24 /* ----- SIDEBAR (PowerBI style) ----- */
25 section[data-testid="stSidebar"] > div {
26     background: linear-gradient(180deg, #fdeaea, #ffffff);
27     border-right: 4px solid #c8102e;
28 }
29
30 section[data-testid="stSidebar"] h2 {
31     color: #000000;
32 }
33
34 /* Filter cards */
35 .filter-card {
```

The dashboard was deployed via Streamlit, an easy-to-use Python framework for data applications. Following local development and testing, the app is launched via Streamlit runtime and opened via a web browser. Such deployment renders the dashboard inoperable as an academic project and more like the analytical tool it is intended, and this also allows for future hosting on sites like Streamlit Community Cloud.

Dashboard Features and Functionality

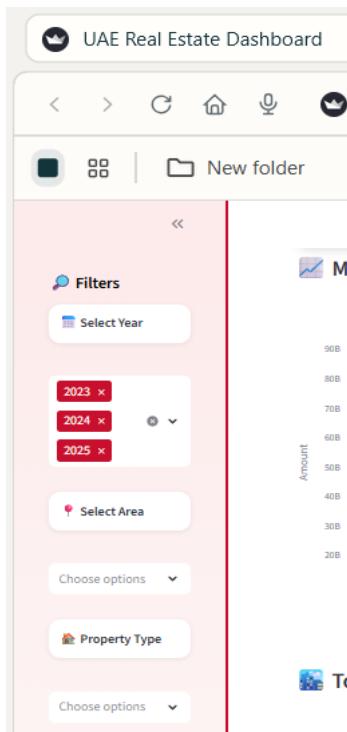
The dashboard is interactive, like Power BI, with a side panel that allows users to filter within the year, by area, and property type. From this, total transactions, total transaction value, and average transaction value serve as key performance indicators that are dynamically updated. Year-on-year changes are also provided to empower users to determine if the market is increasing or decreasing at any time. Monthly transaction value is presented through a line graph to suggest status of the market at certain months, while the monthly consideration of performance is represented through a bar graph that assesses areas by total transaction value. The ability to export this information is present for offline purposes.

Dashboard_Overview.png

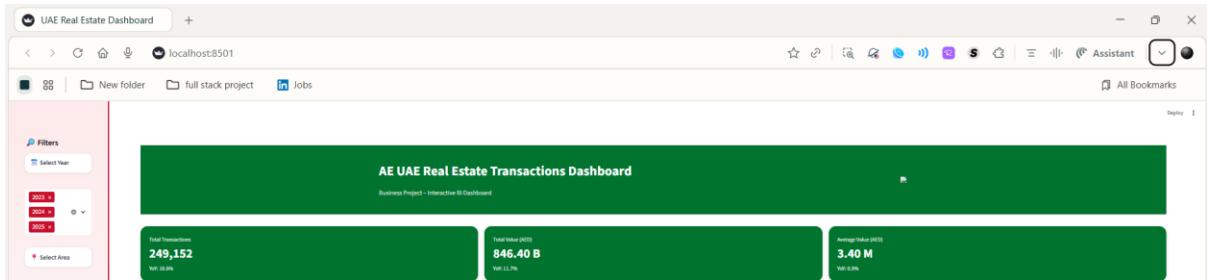


The interactive dashboard is actively interfaced with applied filters and KPI which is shown in the snippet above.

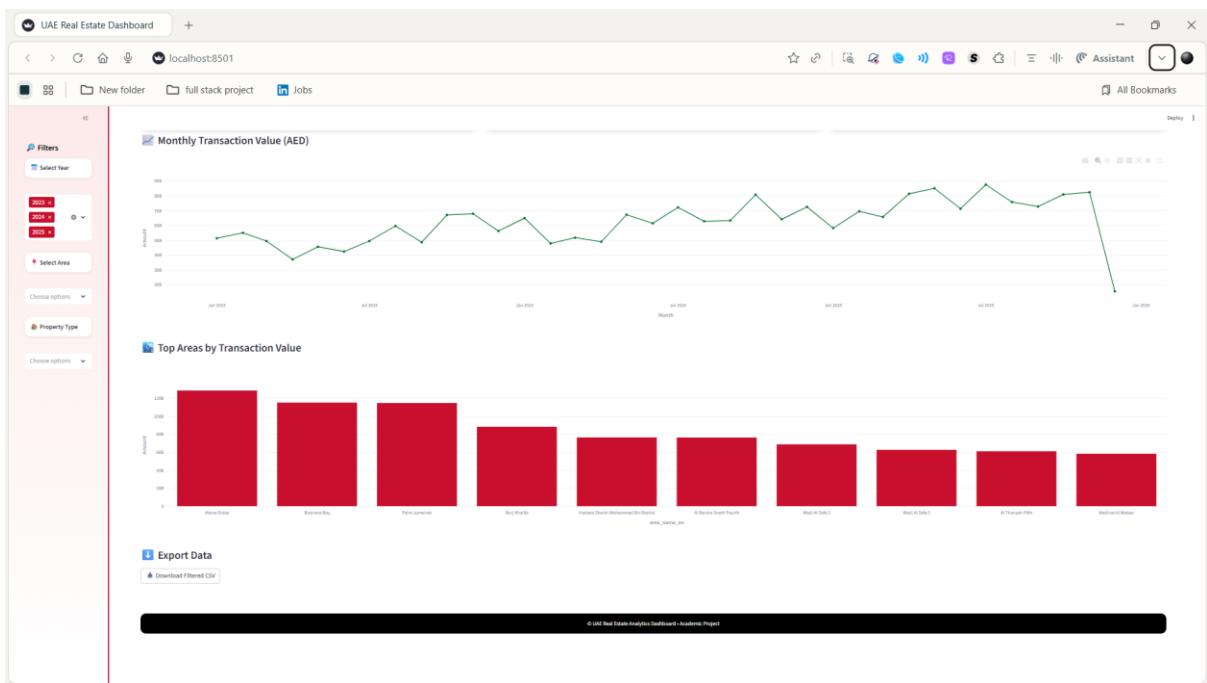
Dashboard_Filters_Applied.png



📸 Dashboard_KPIs_YoY.png



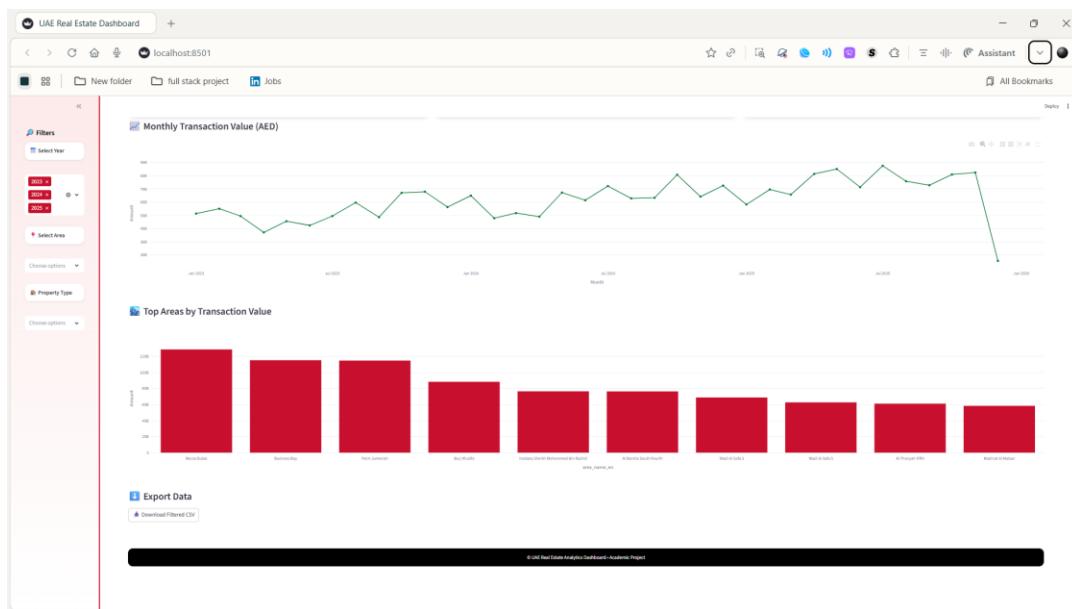
📸 Dashboard_Charts.png



Business Findings and Usefulness

There are numerous findings from the UAE Real Estate Data that can be accessed through the dashboard. For instance, the transaction price fluctuates for different years and months, and the dataset reveals that transaction prices over time have peaks and valleys, which suggests to an investor that valuation may decrease and then requires an adjustment. Additionally, certain emirates possess higher transaction values than others over time, indicating that those investors have higher confidence and a genuine interest in some regions compared to others. The data is filterable, making it user-friendly and allowing specific populations to focus on specific characteristics of the market. For investment purposes, research, or academic findings, this is a very useful tool as a decision support system and not just a reporting system.

“As observed in the monthly transaction trend visualization...”



Project Limitations

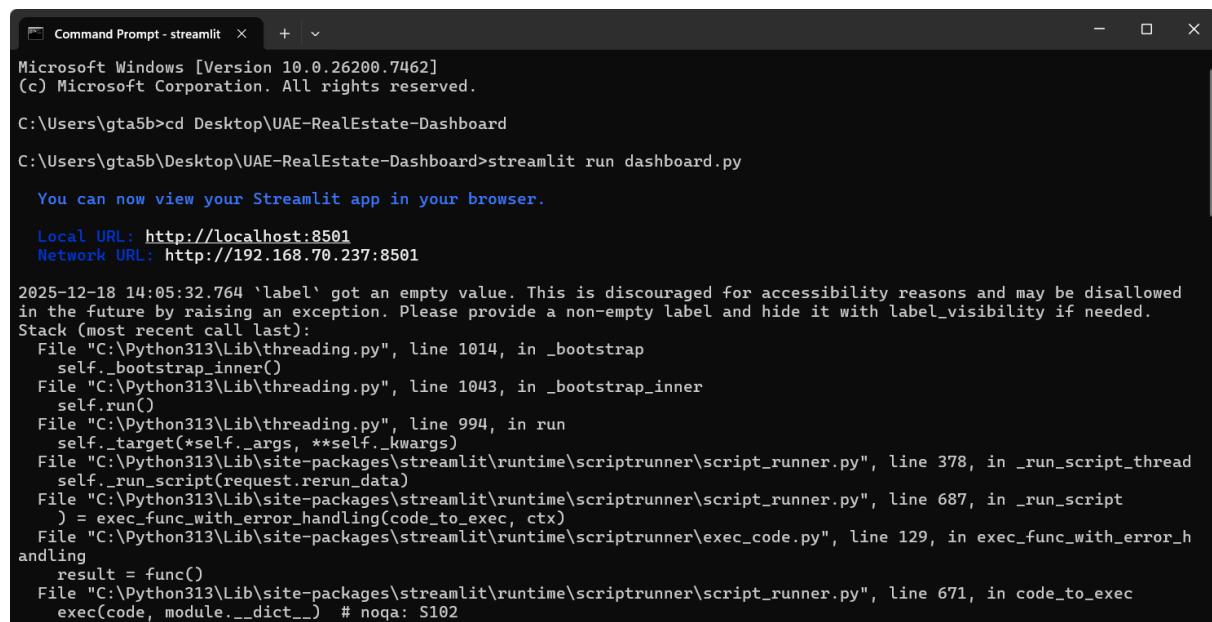
However, limitations exist. This is a very historical data-oriented dashboard and does not currently integrate any live, real-time transaction feeds. Therefore, the assessment comes from what has occurred, not what is happening in the present moment. Furthermore, the project does not include predictive modelling or forecasting – this is descriptive analytics findings to provide a business intelligence project on the topic to propose valuable recommendations and visualization, but not real-time analytics.

Future Improvements Expected

In future iterations, improvements are expected to include live API integrations from real-world feeds for actualized data offerings for market analytics in real-time. The possibility of delving into machine learning modelled price predictions and trends would enable the dashboard to understand data over time for a stronger grasp of what is next. Additionally, access controls through user logins with administrator permissions for data integrity would help make this an enterprise-level type of project. These improvements would help transform this academic exercise into an analytics solution.

Command Prompt Interface

To run the dashboard on a local machine, the user opens the command line in the project's folder and runs the Streamlit application. This will then open the dashboard in a web browser on a local host.



```
Command Prompt - streamlit
Microsoft Windows [Version 10.0.26200.7462]
(c) Microsoft Corporation. All rights reserved.

C:\Users\gta5b>cd Desktop\UAE-RealEstate-Dashboard
C:\Users\gta5b\Desktop\UAE-RealEstate-Dashboard>streamlit run dashboard.py

You can now view your Streamlit app in your browser.

Local URL: http://localhost:8501
Network URL: http://192.168.70.237:8501

2025-12-18 14:05:32.764 'label' got an empty value. This is discouraged for accessibility reasons and may be disallowed in the future by raising an exception. Please provide a non-empty label and hide it with label_visibility if needed.
Stack (most recent call last):
  File "C:\Python313\lib\threading.py", line 1014, in _bootstrap
    self._bootstrap_inner()
  File "C:\Python313\lib\threading.py", line 1043, in _bootstrap_inner
    self.run()
  File "C:\Python313\lib\threading.py", line 994, in run
    self._target(*self._args, **self._kwargs)
  File "C:\Python313\lib\site-packages\streamlit\runtime\scriptrunner\script_runner.py", line 378, in _run_script_thread
    self._run_script(request.rerun_data)
  File "C:\Python313\lib\site-packages\streamlit\runtime\scriptrunner\script_runner.py", line 687, in _run_script
    ) = exec_func_with_error_handling(code_to_exec, ctx)
  File "C:\Python313\lib\site-packages\streamlit\runtime\scriptrunner\exec_code.py", line 129, in exec_func_with_error_handling
    result = func()
  File "C:\Python313\lib\site-packages\streamlit\runtime\scriptrunner\script_runner.py", line 671, in code_to_exec
    exec(code, module.__dict__) # noqa: S102
```

Commands-

1.cd Desktop\UAE-RealEstate-Dashboard

2.streamlit run dashboard.py